

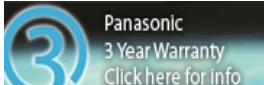
Safety Light Curtains: SQ4 Specifications

Automation Control Products

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Specifications for this product appear below.

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Sensors

Type		For standard liquid	For chemical liquid
Model No.	PNP output	SQ4-A21-P	SQ4-A22-P
	NPN output	SQ4-A21-N	SQ4-A22-N
Sensing object		Water (Standard liquid) (Note 2)	Sulfuric acid, Hydrochloric acid, Phosphoric acid, Ammonia, Fluorinert (Note 3), Galden (Note 3), Hydrofl uoric acid etc. (Note 2)
Supply voltage		12 to 24 V DC ±10 % Ripple P-P 10 % or less	
Current consumption		30 mA or less	
Leakage detection output (Abnormal leakage detection, Safety output)		<PNP output type> PNP open-collector transistor •Maximum source current: 50 mA •Applied voltage: Same as the supply voltage (between detection output and +V) •Residual voltage: 2.5 V or less (at 50 mA source current)	
		<NPN output type> NPN open-collector transistor •Maximum sink current: 50 mA •Applied voltage: Same as the supply voltage (between detection output and 0 V) •Residual voltage: 2 V or less (at 50 mA sink current)	
	Response time	10 ms or less	
	Output operation	ON when initial detection, OFF when detection leakage or wrong installation	
Initial leakage detection output (Initial leakage, Non-safety output)		<PNP output type> PNP open-collector transistor •Maximum source current: 50 mA •Applied voltage: Same as the supply voltage (between detection auxiliary output and +V) •Residual voltage: 2.5 V or less (at 50 mA source current)	
		<NPN output type> NPN open-collector transistor •Maximum sink current: 50 mA •Applied voltage: Same as the supply voltage (between detection auxiliary output and 0 V) •Residual voltage: 2 V or less (at 50 mA sink current)	
	Response time	50 ms or less	
	Output operation	ON when normal condition, OFF when initial detection or accidental leakage	
Protection		IP65 / IP67 (IEC)	
Ambient temperature		-10 to +55 °C +14 to +48.2 °F (No dew condensation or icing allowed) (Note 4), Storage: -10 to +55 °C +14 to +48.2 °F	
Ambient humidity		35 to 85 % RH, Storage: 35 to 85 % RH	
Emitting element		Infrared LED (modulated)	
Material		Enclosure: Polypropylene	Enclosure: PFA
Cable		0.18 mm2 4-core PVC cabtire cable, 2 m 6.562 ft long	0.1 mm2 4-core PFA cabtire cable, 2 m 6.562 ft long
Weight		Net weight: 45 g approx, Gross weight: 110 g approx	

Notes

- Where measurement conditions have not been specified precisely, the conditions used were an ambient temperature of +20 °C +68 °F.
- The agents mentioned above are examples. It may not be detected depending on viscosity the agent. Before using this device, check the detecting liquid and installation condition.
- Fluorinert™ is the world wide trademark of 3M. Galden is the world wide trademark of Solvay Solexis.
- Liquid being detected should be also kept within the rated ambient temperature range.

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Controller

Model No.		SQ4-C11
Applicable standards	International standard	ISO 13849-1 (Category 4, PL _e), IEC 61508-1 to 7 (SIL3), IEC 62061 (SIL3)
	Japan	JIS B 9705-1 (Category 4), JIS C 0508-1 to 7 (SIL3)
	Europe (EU) (Note 2)	EN 55011 Class A, EN 61000-6-2, EN 50178, EN ISO 13849-1 (Category 4, PL _e), EN 61508-1 to 7 (SIL3)
	North America (Note 3)	ANSI/UL 508, CAN/CSA C22.2 No.14
	South Korea	S1-G-1-2009, S2-W-5-2009
	SEMI	Conforming to SEMI-S2-0310a
Power voltage		24VDC+10 / -15 % Ripple P-P 10 % or less
Consumption current		200 mA or less
Control output (OSSD 1, OSSD 2)		PNP open-collector transistor / NPN open-collector transistor (switch method) <Selecting PNP output> •Maximum source current: 200 mA •Applied voltage: Same as power voltage (between control output to +V) •Residual voltage: 2.5 V or less (at 200 mA source current) <Selecting NPN output> •Maximum sink current: 200 mA •Applied voltage: Same as power voltage (between control output to 0 V) •Residual voltage: 2.0 V or less (at 200 mA sink current)
	Response time	20 ms or less (excluding the response time of the sensor)
	Operation mode (Output operation)	ON when initial detection, OFF when detection leakage or wrong installation
Sensor monitor output (AUX1, 2, 3, 4, Non-safety output)		PNP open-collector transistor / NPN open-collector transistor (switch method) <Selecting PNP output> •Maximum source current: 60 mA •Applied voltage: Same as power voltage (between sensor monitor output to +V) •Residual voltage: 2.5 V or less (at 60 mA source current) <Selecting NPN output> •Maximum sink current: 60 mA •Applied voltage: Same as power voltage (between sensor monitor output to 0 V) •Residual voltage: 2.0 V or less (at 60 mA sink current)
	Response time	100 ms or less (excluding the response time of the sensor)
	Operation mode (Output operation)	ON when normal condition, OFF when initial detection or accidental leakage
	Utilization category	DC-12, DC-13
Lockout output		OFF for lockout (Rating: Same as sensor monitor output)
Auxiliary output		Negative logic output of control output 1 / 2 (OSSD 1 / 2) (Rating: Same as sensor monitor output) [Auxiliary output ON when control output 1 / 2 (OSSD 1/2) is OFF]
Functions		Interlock / lockout cancel / Test input / External device monitor / Safety input / Control output polarity selection / Non-safety output polarity selection / Sensor connection number setting
Protection		IP20 (IEC) (However, it should be in IP54 protection structure of control panel)
Ambient temperature		-10 to +55 °C +14 to +48.2 °F (No dew condensation or icing allowed), Storage: -10 to +55 °C +14 to +48.2 °F
Ambient humidity		35 to 85 % RH, Storage: 35 to 85 % RH
PFHD		2.55x10 ⁻⁹ (when connecting 4 safety liquid connecting sensors)
MTTFd		100 years or more
Material		Main unit case: PC / ABS (alloy)
Weight		Net weight: 170 g approx, Gross weight: 440 g approx

Notes

- Where measurement conditions have not been specified precisely, the conditions used were an ambient temperature of +20 °C +68 °F.
- Regarding EU Machinery Directive, a Notified Body, TÜV SÜD, has certified with the type examination certificate.
- With regards to the standards in the US, under the US regulation 29 CFR 1910.7, TÜV SÜD, a Nationally Recognized Testing Laboratory (NRTL) certified by OSHA, has certified with the safety certificate based on UL / ANSI standards. With regards to the standards in Canada, under the safety regulations based on CEC (Canadian Electric Code), TÜV SÜD, a Certification Body accredited by SCC, has certified with the safety certificate based on CSA standards.

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Precautions For Proper Use

- This product is a sensor for detecting leak of fluids.
- When this product is used with safety devices, construct the system such that the device itself.

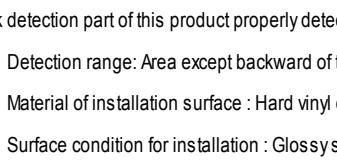
- ▶ This device has been developed / produced for industrial use only.
- ▶ Before using this device, check whether the device performs properly with the functions and capabilities as per the design specifications.
- ▶ Avoid using this device in an explosive atmosphere because this product does not have an explosive-proof protective construction.

Installation

- There is the detection amount difference by directivity of a liquid leakage. When there are a direction from which a liquid leakage happens, and an inclination, please install the nose-of-cam side (opposite side of a cable) of a sensor towards a top.
- Use the mounting bracket MS-SQ4-? (optional) which suits the liquid to detect.
- Periodical checking of operation is recommended with the liquids which are not dangerous (water, alcohol, etc.).
- The amount of detection may change with the conditions of the installation surface.
- Be sure to use the mounting bracket MS-SQ4-? (optional) when installing this device to avoid human error, etc. Reliable detection cannot be guaranteed when this sensor is used alone.

Leakage detection condition and variation factor

- ▶ Leak detection part of this product properly detects the leakage in the following condition.
 - Detection range: Area except backward of this product (liquid must enter to the detection range)
 - Material of installation surface : Hard vinyl chloride or Stainless steel
 - Surface condition for installation : Glossy surface (surface roughness: corresponding 0.4 μmRa) and clean surface.
 - Installation surface angle: Horizontal



- ▶ This product may not detect properly liquid in following element.
 - Liquid kind, consistency (surface tension) and air bubble incorporation.
 - Material, roughness, angle, dirtiness and liquid absorption of surface of installed surface of sensor.
 - Wrong selection of dedicated mounting bracket.

▶ Check the detecting liquid and the installation condition before use.

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